

AGU Fall Meeting 2018 <https://agu.confex.com/agu/fm18/meetingapp.cgi/Paper/451832>

S41D-0559: Integrating seismic source inversion, hypocenter relocation, and geodetic data to resolve the source of the M_w 6.1 earthquake near Fariman, Iran on 5 April 2017

Thursday, 13 December 2018 08:00 - 12:20 *Walter E Washington Convention Center- Hall A-C (Poster Hall)*

Following a M 2.6 foreshock the previous night, a M 6.1 earthquake occurred about 50 km northeast of Fariman, Iran on the morning of 5 April 2017, destroying farmhouses and killing one resident. The aftershock sequence from this event contained two $M \geq 5$ earthquakes and is ongoing. In the instrumental record, no $M \geq 5.2$ earthquake has occurred along the surrounding faults; in the historical record, at least four $M > 7$ earthquakes have occurred to the northwest on the Neyshabur fault system. Seismicity from the mainshock and 21 $M \geq 4.0$ aftershocks was analysed for a regional moment tensor catalog of earthquakes in Iran. The eight resulting moment tensors and centroid depths show shallow mainly oblique-thrust and some strike-slip faulting in the upper 10 km of the crust; the P-axes align NNE consistent with central Iranian block motion relative to Eurasia inferred from GPS data. When relocated using the double-difference relocation software HypoDD, most hypocenters in the sequence align on a plane dipping to the northeast. The mainshock hypocenter near the northwest corner of the immediate aftershocks suggests a rupture that primarily propagated updip and towards the southeast. The inferred northeast-dipping thrust fault is corroborated by nearby mapped faults and surface-deformation measured with InSAR. Large earthquakes along the Neyshabur fault system and nearby faults are rare but destructive, and the interpretation of this sequence should be considered in the region's seismic hazard assessment.

Authors

Daniel Graybeal *University of South Florida Tampa*

Fanghui Deng *University of South Florida Tampa*

S Keivan Hosseini *Ferdowsi University of Mashhad*

Jochen Braunmiller *University of South Florida Tampa*

Timothy H Dixon *University of South Florida Tampa*